

Claims:

1. A method comprising:

providing a series of information portions to a transmitter, the information portions having critical times when they need to be available to a receiver;

estimating whether the information portions can be transmitted by the transmitter in time to be made available to the receiver before the critical time; and

transmitting the information portions to the receiver depending on the estimating.

2. The method of claim 1, wherein the information portions are packets of media frame portions for a multimedia presentation, the presentation including multiple frame portions each frame portion including multiple high priority packets and multiple low priority packets.

3. The method of claim 2, wherein the multiple frame portions each have a decoding time before which all the high priority packets of the frame portion need to be available to the receiver to decode the frame portion in time for presentation at a predetermined presentation time of the frame portion, the decoding time and presentation time being relative to a playing time of the presentation.

4. The method of claim 3, wherein the low priority packets are used to enhance the frame portion during decoding when some but not all of the low priority packets are not available to the receiver at the critical time.

5. The method of claim 1, wherein providing the information portions includes separating information into information portions having different priorities.

6. The method of claim 1, in which providing the information portions includes providing media frame portions and partitioning each frame portion into high priority information portions that are necessary to decode the frame portion and low priority information portions that are only needed to enhance the frame portions.

7. The method of claim 1, wherein the information portions include high priority and low priority packets of media frame portions and all the high priority packets for one frame portion are provided before any low priority packets for the frame portion are provided.

8. The method of claim 1, wherein: the estimating includes determining a target time when one information portion needs to be available to the receiver and determining an estimated transfer time for transmitting the information portion and making the information portion available to the receiver; the estimating includes determining whether the target time exceeds the sum of the estimated transfer time plus the current time of the transmission; and the information portion is transmitted depending on the determination.

9. The method of claim 1, wherein the estimating depends on a buffering limit of the receiver.

10. The method of claim 9, wherein the receiver transmits an indication of the buffering limit to the transmitter.

11. The method of claim 1, wherein the estimating depends on a priority of the information portion being transmitted.

12. The method of claim 8, wherein the information portions include high priority packets and low priority packets and the target time depends on a predetermined delay tolerance that is larger for the high priority packets than for the low priority packets so that the high priority packets are more likely to be received by the receiver than the low priority packets.

13. The method of claim 1, wherein the information portions are packets of media frame portions and the estimating depends on a type of media frame of the packet.

14. The method of claim 8, wherein:

the information portions are portions of a video presentation encoded based on a group of pictures of different types of video frames including I-frames that are decoded independent of the decoding of any other frame, and P-frames that are decoded based on the decoding of the previous I or P-frame, and B-frames that are decoded based in the previous and the following I or P-frame; and

the target time depends on the type of video frame.

15. The method of claim 1, wherein the information portions are packets of media frame portions and the estimating depends

on a decoding time of the media frame portion of the information portion to be transmitted.

16. The method of claim 8, wherein the information portions are packets of media frame portions of a presentation, multiple media frame portions each having a decoding time when packets of the frame portion have to be available at a decoder of the receiver for decoding in time for presentation at a predetermined presentation time of the frame portion, the target time of one information portion depending on the decoding time of the frame portion of the information portion, the decoding time and presentation time of a frame portion being relative to a play time of the presentation.

17. The method of claim 1, wherein the estimating depends on the maximum size on an information portions.

18. The method of claim 1, wherein the transmission includes retransmitting information portions until a predetermined limit on the number of retransmissions is reached or an acknowledgement is received from the receiver that the portion has been successfully received without any uncorrectable errors, and the estimating depends on the retransmission limit.

19. The method of claim 1, wherein the estimating depends on the actual transfer time of previously transmitted information portions.

20. The method of claim 1, wherein the information portions are high priority and low priority packets of media frame

portions and transmitting all the high priority packets for one frame portion begins before the beginning of transmitting the low priority packets for the frame portion.

21. The method of claim 1, wherein transmitting the information portions depends on whether previous information portions were successfully transmitted.

22. The method of claim 1, wherein the information portions have different priorities and transmitting the information portions depends on whether previous information portions with the same or higher priority were successfully transmitted.

23. The method of claim 1, wherein the information portions are high priority and low priority packets of media frame portions and transmitting the high priority packets depends on whether previous high priority packets for the same frame portion have been transmitted and transmitting the low priority packets depends on whether previous high priority and previous low priority packets for the same frame portion have been transmitted.

24. The method of claim 1, wherein the method further comprises receiving a request from the receiver to initiate transmitting the information portions to the receiver.

25. The method of claim 2, wherein the estimating includes multiple estimations during the transmission of packets of a media frame portion, whether all the packets of the media frame portion can be transmitted by the transmitter in time to be

made available to the receiver before the critical time, and the transmitting depends on the multiple estimations for all the packets of the frame portion so that when it is estimated that it is likely that some of the packets for the frame portion will not be transmitted in time, then the remaining packets for the frame portion are not transmitted.

26. The method of claim 2, wherein the information portions for a frame include information portions having different priorities, the estimating includes multiple estimations during the transmission of packets of a media frame portion, whether all the packets of the media frame portion of a priority can be transmitted by the transmitter in time to be made available to the receiver before the critical time, and the transmitting of packets of the same or lower priority depends on the multiple estimations for all the packets of the frame portion of the priority so that when it is estimated that it is likely that some of the packets for the frame portion of the priority will not be transmitted in time, then the remaining packets for the frame portion for the same or lower priority are not transmitted.

27. A method comprising:

separating a media stream for a performance into multiple media streams with different priorities for transmission over a network having a variable conditions, the media stream having a predetermined schedule;

determining whether to transmit portions of the multiple media streams depending on the priorities and on the network conditions so that the perceived quality of the performance is

increased relative to attempting to transmit all of the multiple media streams; and

transmitting the portions of the multiple media streams depending on the determination.

28. The method of claim 27, wherein the network is a wireless network and packets are transmitted serially, and each packet is transmitted and retransmitted until an acknowledgement is received or a retransmission limit is reached.

29. A transmitter for transmitting information portions to a receiver, comprising:

means for providing a series of information portions that need be available to the receiver at critical times;

means for estimating whether the information portions can be transmitted by the transmitter in time to be made available to the receiver before the critical time; and

transmitting apparatus to transmit the information portions to the receiver depending on the estimating.

30. The transmitter of claim 29, wherein:

the transmitter further comprises means for receiving an indication of the size of buffering from the receiver; and

the estimating depends on the indication of the size of buffering in the receiver.

31. The transmitter of claim 29, wherein:

the transmitter further comprises means for determining a decoding time of the information portions; and

the estimating depends on the decoding time of the information portions.

32. The transmitter of claim 29, wherein:

the means for providing information portions includes means for partitioning information into information portions having different priorities; and

the estimating depends on the priorities of the information portions.

33. A receiver comprising:

means for requesting a transmitter to transmit information portions that have to be available to the receiver at critical times;

means for buffering information portions that arrive before the critical time; and

means for transmitting an indication of the size of the buffering to the transmitter.

34. The receiver of claim 33, wherein:

the information portions are packets for encoded media frames, each of multiple media frames containing multiple packets;

the receiver further comprises a buffer for storing the packets and means for decoding the packets at the critical time;

all the packets for a frame contain the same timestamp; and

all the packets for a frame are identified based on the same timestamp and transferred together to the decoder.

35. The receiver of claim 33, wherein:

the information portions are packets for encoded media frames, each of multiple media frames containing multiple packets;

the receiver further comprises a buffer for storing the packets and means for decoding the packets at the critical time;

the packets include high priority packets and low priority packets;

all the packets contain an indication of their priority;

the high priority packets for a frame are received before the low priority packets for the frame are received; and

all the packets for a frame are identified by the changes in the indication of packet priorities and transferred together to the decoder.